UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
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BOSTON, MASSACHUSETTS 02114-2023

December 15, 1999

James Shafer, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: TECHNICAL REVIEW COMMENTS ON THE SUPPLEMENTAL SITE INVESTIGATION REPORT FOR TANKS 42, 45 AND 48, TANK FARM 4

Dear Mr. Shafer:

EPA reviewed the *Supplemental Site Investigation Report for Tanks 42, 45 and 48 at Tank Farm 4, dated September 1999* for technical sufficiency, applicable regulations, EPA guidance, and generally accepted practice. Detailed comments are provided in Attachment A.

Groundwater samples collected as part of the SSI were collected using a disposable bailer. Please discuss why the *U.S. Environmental Protection Agency Region I Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*, July 30, 1996, Revision 2, was not followed for this investigation. The bailer method has been used in past investigations. The use of low stress purging and sampling improves data quality for all inorganic and organic groundwater sample results and generates more reproducible and representative evaluation of actual groundwater conditions.

In addition, as part of the low flow sampling technique, pH, temperature, conductivity, and turbidity are measured for stabilization. As part of this SSI investigation only pH, temperature and conductivity were used as stabilization criteria. While turbidity was measured after each well volume, it was not used as a stabilization criterion. As a result of not using turbidity as a stabilization criterion, turbidity measurements at the time of sample collection in many cases were well above 5 NTU - the low flow stabilization criterion. For example, monitoring wells MW-801, MW-808 and MW-330 had a turbidity levels of 602 NTU, 801 NTU and 582 NTU, respectively. Because of the high levels of turbidity, analytical results may not present a true representation of actual groundwater conditions.

Tank Farm 4 consists of 12 concrete underground storage tanks (USTs) that historically have stored heavy fuel oil No. 6 and No. 2 fuel oil. The objective of the SSI was to evaluate the effectiveness of the interim action by sampling groundwater and subsurface soil from zones of petroleum-impacted soil. Based on data obtained from the SSI, the need for a Corrective Action Plan (CAP) will be evaluated. As part of the SI investigation several monitoring wells were

installed and sampled. As noted, the contaminants of concern at Tank Farm 4 include both heavy and light oils, thus the presence of both LNAPLs and DNAPLs is a concern. No.6 oil may be present at the site as a DNAPL. DNAPLs can have rapid migration once in the bedrock fracture network and will be governed by the orientation of the geological structure. The bedrock surface at Tank Farm 4 is characterized by a zone of highly altered and fractured rock. Petroleum contamination was found in both of the bedrock wells during the SI at Tank 48 and again in one of the two bedrock wells sampled during the SSI at Tank 48. Since the presence of TPH in the bedrock aquifer confirms the migration of petroleum from impacted soils to the bedrock fractures, it is unclear why only two bedrock wells, both located at Tank 48, were sampled during the investigation to evaluate the presence of DNAPLs. Further evaluation of the bedrock aquifer at Tanks 42, 45, and 48 is needed to evaluate whether petroleum contamination is present before making any recommendations for the site.

In addition to the heavy oils historically stored at Tank Farm 4, No. 2 fuel oil was also stored. The presence of No. 2 fuel oil would pose the concern for LNAPLs at the site. Lighter oils with a specific gravity lighter than water will tend to float on top of the water table. Since LNAPLs are a possible concern at the site, it is unclear why several monitoring wells were screened below the water table and not at the water table to determine the presence of LNAPL. For instance, the groundwater elevation at MW-801 located at Tank 42 is 3.4 feet above the top of screen, the groundwater elevation at MW-330 located at Tank 45 is 10 feet above the top of screen and the groundwater elevation for MW-809 is 0.5 feet above the top of screen. Since lighter oils are of concern at Tank Farm 4, a more comprehensive evaluation of groundwater at the water table interface would be needed before making any recommendations for the site.

The report does not include a discussion of investigation derived wastes (IDWs). The report should include what was done to dispose IDWs including purge water, wash water, drill cuttings and personal protection equipment.

The text states that analytical results from Tank 42, 45 and 48 were not validated, but did undergo a minimum level data review. Please note that since data collected from these three areas was not validated, it cannot be used for future risk assessments at the site.

I look forward to working with you and the Rhode Island Department of Environmental Management toward the cleanup of the tank farms. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Paul Kulpa, RIDEM, Providence, RI
Melissa Griffin, NETC, Newport, RI
Jennifer Stump, Gannet Fleming, Harrisburg, PA
Mary Philcox, URI, Portsmouth, RI
David Egan, TAG recipient, East Greenwich, RI

ATTACHMENT A

Page	Comment
p. 2-6, §2.3	This section gives a brief evaluation of the data that was provided in the Site Investigations (SIs) conducted at Tanks 42, 45 and 48. Included in this discussion is the identification of soil borings that exhibited elevated levels of TPH in soils located in the vicinity of the three tanks. A map with the locations of all borings installed during the SI would be helpful if included in this report. Also, to better understand the previous investigations and the relationship with the current SSI, the text should state the total number of soil borings installed and soil samples collected during the SI around each tank and include the analytical results.
p. 2-9, §2.5	During tank demolition activities, the tanks were imploded and then backfilled with certified clean fill. The text states that the "ballast water was removed from the tanks and pump rooms prior to sand placement." The text however does not state how the ballast water was disposed. If the water was discharged as a non-hazardous waste, a sample of the ballast water should have been collected and analyzed for VOCs, SVOCs, RCRA metals and TPH before disposal to ensure that the tanks had been adequately cleaned and that residual contaminants, if any, had not impacted the ballast water. Please discuss the disposition of the ballast water and disposal criteria.
p. 3-3, §3.3.1	Groundwater elevations collected during the December 1995 sampling event were used to construct an interpretive water table map. These elevations were used since, according to the text, many wells from the previous investigation were damaged and therefore complete round of groundwater levels could not be preformed. Since several new monitoring wells were installed as part of the SSI investigation to replace those wells that were damaged or destroyed, it is unclear why a groundwater contour map could not be constructed with data collected as part of the SSI investigation.
p. 3-3, §3.3.2	According to the text, hydraulic conductivity measurements were collected during the SI conducted at Tank 45 and 48. From this discussion, it appears that there were no hydraulic conductivity measurements collected from Tank 42 during the SI. Please discuss why this additional data was not collected as part of the SSI.
p. 4-3, §4.1.1	Soil boring/monitoring well, SB-806/MW-806 was installed to investigate potential petroleum migration outside the tank socket of Tank 42. SB-806 was advanced to 20 feet bgs and it was noted in the boring log that a light sheen was observed on the wash water at 20 feet bgs. The monitoring well was installed to a depth of 16 feet bgs and screened from 6 to 16 feet bgs, immediately above bedrock. A groundwater sample was not collected from MW-806 since it was dry

at the time of sampling. To adequately evaluate whether petroleum has migrated in the groundwater downgradient from the Tank 42, a bedrock well, screened at 20 feet bgs or deeper, needs to be advanced in the vicinity of MW-806 to obtain representative groundwater samples.

In addition, it is not clear why soil and groundwater were not evaluated in the vicinity of previously installed MW-411 located in the fill area upgradient from Tank 42. According to Figure 4-2, soils collected from MW-411 exhibited elevated levels of TPH at depths of 65.9 to 63.9 feet MLW at a concentration of 3,900 mg/kg and 56.9 to 55.0 feet MLW at a concentration of 1,800 mg/kg. Since this area had elevated levels of petroleum contamination during the SI it appears that this area should have also been evaluated during the SSI to evaluate the effectiveness of the interim actions.

p. 4-11, Table 4-3 — The lead concentration of 16.0 ug/L detected in groundwater collected from MW-123 during the 1994 sampling event exceeds both the GA Groundwater Quality Standard (GWQS) and the GA Preventative Action Limit (PAL). This concentration is shown in the table in bold, however since it exceeds both the GA GWQS and GA PAL standards the concentration should be both bold and italicized. Please edit accordingly.

p. 5-4, §5.1.1 — The first sentence in the forth paragraph on this page states that soil borings SB-803 and SB-804 were advanced adjacent to the previously installed soil borings SB-330 and SB-335. Section 2.3, however lists the two previously installed borings as SB-330 and SB-225. This inconsistency should be corrected.

p. 5-5, Table 5-2 — Under the "Notes" in Table 5-2, Note (1) states "SB-802 located 4.8 ft from SB-119." SB-119 should be changed to SB-122.

Figures 5-1, 5-2, & 5-3 — The figures show analytical results for monitoring wells MW-331 and MW-332 both located in the tank socket area upgradient and side gradient, respectively from Tank 45. The text however does not discuss these wells. Since elevated levels of TPH were detected in soils collected from SB-331 and SB-332 during the 1995 investigation, as shown on the figures, it is unclear why these areas were not evaluated or discussed as part of the SSI. In order to adequately evaluate the effectiveness of the interim actions soils and groundwater in these two areas need to be evaluated.

p. 5-15, Table 5-3 — The concentrations for arsenic, chromium and lead, 656 ug/L, 406 ug/L and 722 ug/L, respectively, detected in groundwater collected from MW-122 during the 1994 sampling event all exceed both the GA Groundwater Quality Standard (GWQS) and the GA Preventative Action Limit (PAL). These concentrations are shown in bold in the table, however since they exceed both the GA GWQS and

GA PAL standards these concentrations should be both bold and italicized. Please edit accordingly.

p. 5-18, §5.2.2 The text states that TPH was detected in groundwater collected from existing monitoring well, MW-330 and replacement well MW-802, both located in the fill area immediately adjacent to Tank 45. Elevated levels of TPH were also detected in soils collected from SB-802 and SB-803, (the corresponding interim action boring to SB-330) as well as SB-804, SB-807 and SB-808 all located downgradient from the tank. The text then goes on to state "that a strong correlation does not exist between TPH concentrations in soil and TPH concentrations in groundwater" and that "groundwater is not a significant migration pathway for petroleum compounds released from the tank." Since elevated levels of TPH were observed in soils collected from all downgradient soil borings it is unclear how this statement could be justified.

p. 6-3 §6.1.1 The text states that monitoring wells MW-408 and MW-422 were repaired as part of the SSI. During the 1995 investigation MW-408 showed elevated levels of TPH in soils. Since these two wells were repaired, it is unclear why these wells were not sampled.

p. 6-8, Figure 6-2 The area labeled "Outwash" should be moved above the area labeled "Generalized Bedrock Surface."

p. 6-9, §6.1.3 Soils collected from soil boring SB-805 were collected at a depth of 33 to 35 feet bgs. These soils were collected with the intent to obtain a sample from a depth comparable to soils collected from SB-119, advanced during the SI, which exhibited a TPH concentration of 5,300 mg/kg. Soils collected from MW-119 were collected at a depth of 27 to 29 feet bgs. Since the objective was to obtain a soil sample at a comparable depth, it is not clear why soils collected from SB-805 were collected from a depth five feet below soils collected from SB-119.

p. 7-2, §7.2.1 The summary section for Tank 42 states that data collected from soil boring/monitoring well SB-806/MW-806, located downgradient from SB-801/MW-801, indicate that petroleum has not migrated beyond the tank socket fill materials. Groundwater downgradient from Tank 42 was not evaluated as noted in the Specific Comment on page 4-3, Section 4.1.1. Before making the above statement, please address the data gaps identified in earlier comments.